

**REMARKS**

Applicants' representative thanks the Examiner for the courtesies extended during the telephonic conference on June 6, 2007, with Francis Dunn. During the conference, there was discussion with regard to the Examiner's rejections of the subject claims under 35 U.S.C. § 103, as set forth in the Office Action, dated March 30, 2007. In particular, there was discussion regarding a "sequence of system actions." There was also discussion regarding a proposed amendment to emphasize certain distinctive aspects of the claimed subject matter, including a decision model that employs probability to determine likelihood of success in automatically routing an incoming call, where the likelihood of success is determined based in part on a sequence of system actions associated with the incoming call and is re-determined after the occurrence of each system action. The Examiner indicated that the proposed amendment may produce allowable matter.

Claims 1, 2, 4, 5, 10, 19, 20, and 35 have been amended as shown on pages 2-8 of the Reply. No new matter has been added.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

**I. Objection to Claim 20**

Claim 20 is objected to by the Examiner due to minor informalities. Withdrawal of this objection is respectfully requested in light of the amendment to claim 20 made herein.

**II. Rejection of Claims 1-10 and 12-36 Under 35 U.S.C. § 103(a)**

Claims 1-10 and 12-36 stand rejected to under 35 U.S.C. § 103(a) as being unpatentable over Joseph, *et al.* (US 6,807,274) in view of Bala (US 6,798,876). It is requested that this rejection be withdrawn for at least the following reason. Joseph, *et al.* and Bala, either alone or in combination, do not disclose, teach, or suggest each and every element of the subject claims.

To reject claims in an application under § 103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See MPEP § 706.02(j)*. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *See In re Vaech*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The claimed subject matter relates to a call routing and decision system that can automatically route incoming calls and can provide automated responses to callers. The claimed subject matter can employ one or more decision models to facilitate efficient operations of the system, provide more efficient coupling between callers and respondents, and mitigate caller frustration when interacting with such system. The decision models can be trained *via* a data log that can have recorded data of past activities and interactions with the call routing system, for example. Such data can include statistical information relating to, for example, how often the system finds the name of the person desired by the caller in the directory, how often an operator has been requested by callers, and how often callers quit sessions, among other categories. The decision models can employ probability to determine the likelihood of a successful outcome (*e.g.*, automatically routing call to a member of an organization) to the incoming call. The probability can be based on various dialog features, such as a sequence of system actions, the number of dialog turns, and/or the length of the session, for example. Output from the decision models can be employed for call routing determinations, as the call routing system can work in concert with the decision models to facilitate call routing between callers and individuals to be contacted. In accordance with another aspect of the claimed subject matter, if a caller has trouble making a connection with a party, the system can switch from the automated system and connect the caller to a human operator to provide further assistance to the caller.

In particular, independent claim 1 (and similarly independent claims 19 and 20), as amended, recites: a decision model . . . *that employs probability to determine likelihood of success in automatically routing the incoming call, the likelihood of success determined based in part on a sequence of system actions associated with the incoming call and is re-determined after the occurrence of each system action, to mitigate transferring the incoming call to an operator.* Joseph, *et al.* and Bala, either alone or in combination, do not disclose, teach, or suggest this distinctive feature of the claimed subject matter.

Rather, Joseph, *et al.* discloses an interactive voice response system for providing customer service and routing calls from manual to automated dialogs. (See col. 1, lns. 7-10). The system has the caller identify the task or problem the caller desires resolved, and the system performs a database look-up to determine whether the caller should be routed through the automated system or to a service representative, where the database can include statistical data representing past calls and success rates. (See col. 3, lns. 43-49, 59-62; col. 4, lns. 1-32).

The Examiner concedes that Joseph, *et al.* fails to disclose a decision model “*that employs probability to determine likelihood of success in automatically routing the incoming call, the likelihood of success determined based in part on a sequence of system actions associated with the incoming call, to mitigate transferring the calls to an operator.*” (See Office Action dated March 30, 2007, p. 3, lns. 8-13). Additionally, Joseph, *et al.* is silent regarding re-determining and updating the likelihood of success after the occurrence of each system action to facilitate determining routing of the incoming call.

Further, Bala fails to teach or suggest the distinctive functionality of the claimed subject matter. Rather, Bala teaches a method and apparatus for specifically routing a call based on a profile of a caller, and a profile of a call center representative, and for updating the system based on experience to provide more accurate call routing. (See *Abstract*). Bala teaches identifying a caller and retrieving a profile on the caller. (See col. 2, lns. 26-28). The caller is then prompted with a list of questions. (See col. 2, lns. 28-29). The caller profile and answers to the prompted questions are then compared with stored customer service representative profiles to determine which representatives are

more qualified to handle the incoming call. (*See col. 2, lns. 29-33*). The representatives are ranked and the call is routed to the highest ranking representative. (*See col. 2, lns. 33-36*).

However, unlike the claimed subject matter, Bala fails to teach or suggest determining a likelihood of success in automatically routing an incoming call, where the likelihood of success is based on a sequence of system actions associated with the call. Instead, Bala teaches identifying the caller, or the product or service the caller is calling about, and then using past data regarding the caller, the product/service, or the service representatives in order to determine the representative to which the call should be routed. (*See col. 4, lns. 26-65*). While Bala discloses prompting the caller to provide answers to questions, (*see col. 2, lns. 28-29*), Bala does not disclose determining a likelihood of success in automatically routing an incoming call based on the *sequence* of system actions associated with the incoming call, as Bala discloses performing a single statistical analysis after the system has received all answers from the caller.

Further, Bala fails to teach or suggest re-evaluating the likelihood of success in automatically routing an incoming call after the occurrence of each system action. Rather, Bala teaches making a single determination regarding the service representative to which a call is to be routed. (*See col. 2, lns. 33-36*).

In contrast, the claimed subject matter can include a decision model that can employ probability to determine the likelihood of success in automatically routing a call to a member of an organization. The likelihood of success can be determined *based on a sequence of system actions* (e.g., operator introduction, requesting the name of the member sought, requesting the user to pick an option) associated with the incoming call. Further, after the occurrence of a system action in the sequence of system actions, the decision model can re-calculate the probability and *re-determine the likelihood of success* in automatically routing the incoming call given the current position of the incoming call in the sequence of system actions. The output of the decision model can be utilized by the automated call routing component to facilitate making a determination with regard to whether the incoming call should remain in the automated system or be routed to an operator, for example.

Further, claim 7 recites: *the decision model employs a probability tree to determine the likelihood of success in automatically routing the incoming call given a sequence of system actions.* Joseph, et al. and Bala, either alone or in combination, do not teach or suggest this distinctive aspect of the claimed subject matter.

Rather, Joseph, et al. simply discloses utilizing a *query tree* to determine the task to be performed. (See col. 2, ln. 66 – col. 3, ln. 5). The Examiner concedes that Joseph, et al. fails to disclose such distinctive functionality of the claimed subject matter. (See Office Action dated March 30, 2007, p. 5, lns. 5-7). However, the Examiner contends that Bala discloses “the decision model employs a probability tree to determine the likelihood of success in automatically routing the incoming call given a sequence of system actions.” (See Office Action dated March 30, 2007, p. 5, lns. 8-11). Applicants’ representative respectfully submits that the Examiner’s contention with regard to Bala is erroneous.

Bala is silent regarding employing a probability tree to determine a likelihood of success in automatically routing an incoming call given a sequence of system actions. Instead, Bala discloses determining a service representative to which a call should be routed by performing a statistical analysis of historical data regarding customer service representative attributes and caller attributes, as well as identification of the product/service that is associated with the purpose of the call. (See col. 3, lns. 51-57; col. 4, lns. 26-28). Further, Bala is silent regarding using probability in making a determination as to call routing. Rather, Bala teaches weighting different parameters, based on the preferences of the person or company implementing the system, to be used in performing a statistical analysis of information to make a determination as to call routing. (See col. 3, lns. 51-57; col. 4, lns. 61-63).

In contrast, the claimed subject matter can employ a probability tree where probability can be employed to determine the likelihood of success in automatically routing an incoming call. The probability tree can be displayed as a tree where each branch can represent a system action, for example. The likelihood of success in routing the incoming call can be determined based on the sequence of system actions.

Moreover, claim 8 recites: *the decision model determines the likelihood of success based on p(SpeakFound|E), wherein SpeakFound is the member, E is*

*observational evidence of system actions taken, and p is a probability, in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequence.* Joseph, *et al.* and Bala, either alone or in combination, do not teach or suggest such distinctive functionality of the claimed subject matter.

Instead, Joseph, *et al.* simply discloses that probability is used to determine whether the detected task can be successfully resolved by the automated system. (*See* col. 3, lns. 66-67). The Examiner concedes that Joseph, *et al.* does not disclose the distinctive functionality of the claimed subject matter. (*See* Office Action dated March 30, 2007, p. 5, lns. 12-17). However, the Examiner contends that Bala discloses “the decision model determines the likelihood of success based in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequences.” (*See* Office Action dated March 30, 2007, p. 5, ln. 17 – p. 6, ln. 2). Applicants’ representative respectfully submits that the Examiner’s contention with regard to Bala is erroneous.

Bala fails to teach analyzing the systems actions already taken with regard to an incoming call, and then analyzing historical information regarding system actions in action sequences and using probability to determine the likelihood of success of automatically routing the incoming call. Rather, Bala teaches looking at historical data relating to the caller and the customer service representatives, as well as information identifying the product/service the caller is calling about, to determine the representative to which the call should be routed. (*See* col. 3, lns. 51-57; col. 4, lns. 26-28). Further, as stated, Bala is silent regarding using probability in making a determination as to call routing. Instead, Bala teaches weighting different parameters, based on the preferences of the person or company using the system, to be used in performing a statistical analysis of information to make a determination as to call routing. (*See* col. 3, lns. 51-57; col. 4, lns. 61-63).

In contrast, the claimed subject matter can determine the likelihood of success in automatically routing an incoming call to a person can be based on a probability determination associated with finding the name of the person desired by the caller in the directory. The probability can be determined based on the system actions already taken

with regard to the current incoming call, and historical data from logged cases regarding the number of cases at the same position in the action sequence that were ultimately successful as compared to the total number of cases along the action sequence.

In view of at least the foregoing, it is readily apparent that Joseph, *et al.* fails to disclose each and every element of the claimed subject matter as recited in independent claims 1, 19, and 20 (and associated dependent claims 2-10, 12-18, and 21-36).

Accordingly, it is believed that the subject claims are in condition for allowance, and the rejection should be withdrawn.

### **III. Rejection of Claim 11 Under 35 U.S.C. § 103(a)**

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Joseph, *et al.* (US 6,807,274) in view of Bala (US 6,798,876), and further in view of Chittineni (US 4,747,054). It is requested that this rejection be withdrawn for at least the following reason. Joseph, *et al.*, Bala, and Chittineni, alone or in combination, do not disclose, teach, or suggest each and every element of the claimed subject matter. Claim 11 depends from independent claim 1. Chittineni fails to cure the aforementioned deficiencies of Joseph, *et al.* and Bala as to independent claim 1. Rather, Chittineni relates to a process for defining similarities and differences between two signals that carry common information but have undergone differing response mechanisms. (*See col. 1, lns. 61-64*). Thus, it is believed that claim 11 is in condition for allowance, and the rejection as to claim 11 should be withdrawn.

**CONCLUSION**

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063[MSFTP471US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,  
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